

**METHOD AND APPARATUS FOR CONTROLLING THE FLOW  
RESISTANCE OF A FLUID ON NANOSTRUCTURED OR  
MICROSTRUCTURED SURFACES**

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A method and apparatus is disclosed wherein the flow resistance of a droplet disposed on a nanostructured or microstructured surface is controlled. A closed-cell feature is used in a way such that, when the pressure of at least a first fluid within one or more of the cells of said surface is decreased to or

10 below a desired level, a droplet disposed on that surface is caused to at least partially penetrate the surface. In another illustrative embodiment, the pressure within one or more of the cells is increased to or above a desired level in a way such that the droplet of liquid is returned at least partially to its original, unpenetrated position. In yet another embodiment, a closed-cell

15 structure feature pattern is used to prevent penetration of the nanostructured or microstructured surface, even when the pressure of the fluid disposed on the surface is relatively high.